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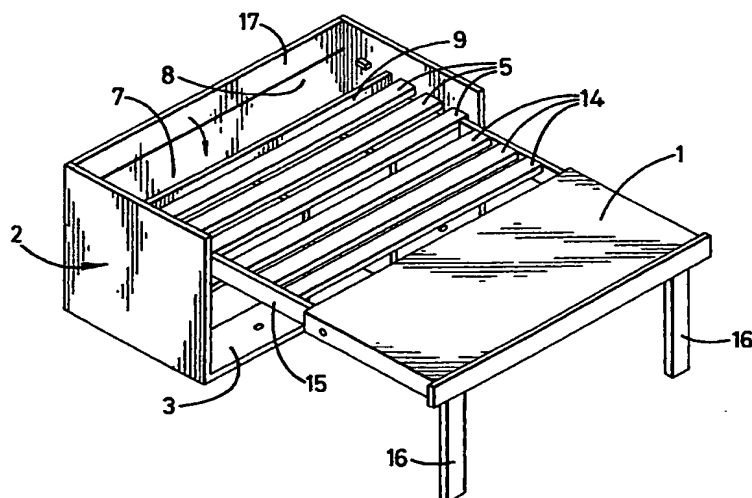
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(54) Title: DESKS



(57) Abstract: The top (1) of a knee-hole desk pivots up from a carcass (2) to convert the desk to a bed in which the top (1), supported by folding legs (16), extends horizontally from the carcass (2) with a slatted frame (15) between them. A futon (10) for support on the extended top (1), frame (15) and carcass (2), is accommodated before conversion of the desk, partially within a vertical recess (7) of the base (2) and partially in a recess (6) under the top (1). In an alternative desk (Figs 5-7) having a twin-pedestal base (22) with hinged headrests (33), the top (21) is backed by a plastics-foam sheet (26) and pivots up and over to extend from the base (22) upside-down and supported horizontally by folding legs (31). Pedestal-height is reduced telescopically through counterbalancing-and-locking mechanisms (32), such that a plastics-foam sheet (27) supported flat on the base (22) by plastics-foam slabs (29), forms the bed-support surface in conjunction with the sheet (26).

Desks

This invention relates to desks.

5 The growing trend for homeworking increases the need for desks to be used in the home, placing demands on domestic space. The spare bedroom is often used as an office, but is frequently not big enough to provide space sufficient for both a bed and a desk or for both to be used
10 comfortably.

It is one object of the present to provide a form of desk that may be used to mitigate the above problem.

15 According to the present invention there is provided a desk comprising a base-structure and a desk-top supported by the base-structure, wherein the desk-top is moveable relative to the base-structure for conversion of the desk to a bed, the desk-top when so moved extending
20 substantially horizontally from the base-structure for defining with the base-structure an elongate substantially-horizontal support-surface of the bed.

The desk of the invention accordingly has two
25 configurations in a first of which it has the form of, and is useable conventionally as, a desk, and in the second of which, following movement of the desk-top as aforesaid, is useable as a bed. Accordingly, the desk of the invention combines in the one item of furniture, the
30 two functions of desk and bed, and can be readily converted from one to the other. The desk therefore offers the possibility of saving domestic space in the provision of desk- and bed- functions selectively.

35 The desk-top may be pivotally mounted on the base-structure, and in this regard may be pivoted to a frame-member that is itself pivoted to the base-structure. In

the latter circumstances, the frame-member may extend substantially horizontally from the base-structure intermediate the base-structure and the desk-top as part of said support-surface when the desk is converted to a bed.

As an alternative, the desk-top may be pivoted to the base-structure for lifting up and over to extend upside down substantially horizontally from the base-structure. In these circumstances, the upper work-surface of the desk-top may be backed by a sheet of plastics foam such that said sheet is uppermost when the desk is converted to a bed. Also, the base-structure may be a pedestal-supported panel having an upper surface of plastics foam, and the desk may include means for selective adjustment of the height of the base-structure.

The desk of the invention may include provision for accommodating and retaining a mattress or futon for use with the bed. More especially, and according to a feature of the present invention, there is provided a desk wherein the base-structure for supporting the top of the desk includes interconnected recesses for accommodating and retaining a mattress or futon within the desk, the recesses extending within the desk from a first recess covered by the desk-top into a second recess located behind an upright wall of the base-structure, and wherein the desk-top is moveable relative to the base-structure for conversion of the desk to a bed, the desk-top when so moved extending substantially horizontally from the base-structure for defining with the base-structure an elongate substantially-horizontal support-surface of the bed and uncovering the first recess to enable release of the mattress or futon from within the second recess for deployment on the support-surface.

Two forms of desk in accordance with the invention will now be described, by way of example, with reference to the accompanying drawings, in which:

5 Figure 1 is a perspective view from the front, of a first of the convertible desks of the invention, when configured for use as a desk;

10 Figure 2 is a sectional view of the desk of Figure 1 when configured for use as a desk and containing a futon, the section being taken on the lines II-II of Figure 1;

15 Figures 3 and 4 are a side elevation and a perspective view respectively, of the desk of Figure 1 when converted to have the form of a bed, successive stages of the conversion being illustrated in broken line in Figure 3;

20 Figure 5 is a perspective view from the front of the second desk of the invention when configured for use as a desk;

25 Figure 6 is a sectional view of part of the desk of Figure 5, the section being taken on the line VI-VI of Figure 5; and

Figure 7 is a perspective view from the front, with parts broken away, of the desk of Figure 5 when converted to have the form of a bed.

30 Referring to Figures 1 and 2, the substantially-horizontal top 1 of the desk is supported on a base or carcass 2 that includes two drawer-units 3. The units 3 are spaced laterally from one another to define a well 4 to accommodate the desk-user's legs when he/she is
35 sitting up to the desk.

As shown by Figure 2, the height of the well 4 is defined by horizontal slatting 5 of the carcass 2. The slatting 5, which extends across the full width of the desk over the units 3, is spaced below the desk-top 1 to leave a recess 6 in the carcass 2, covered by the top 1. The horizontal recess 6 is contiguous with, so as to extend into, a vertical recess 7 that throughout the full width of the desk is defined in the carcass 2 between an upright back wall 8 of the desk and an upright inner wall 9. The recesses 6 and 7 combine to provide accommodation and support for a futon 10 concealed within the desk.

The futon 10 is accommodated in a folded condition within the desk. Approximately two thirds of the futon-length is received folded in half as portions 11 and 12 standing upright within the recess 7, whereas the remaining portion 13 extends folded down substantially horizontally from the portion 12 into the recess 6. The futon-portion 13 lies under the desk-top 1 on the slatting 14 of a partially-slatted frame 15 that rests within the recess 6 on the slatting 5. The frame 15, which is pivoted on either side to the desk-top 1 towards the back of the desk, is itself pivoted to the carcass 2 at the front of the desk.

When the desk has the normal configuration shown in Figures 1 and 2, it is useable as, and provides the conventional facilities of, a knee-hole desk. However, the configuration of the desk can be changed to convert it into a bed simply by releasing a lock (not shown) that secures the top 1 covering the carcass 2 and lifting the top 1 up from the carcass 2 about the pivoting with the frame 15. This allows the futon-portion 13 to rise from the recess 6 and be freed from within the frame 15 as the top 1 is pulled inclined upwards and forwards in the direction from back to front of the desk.

Once the futon-portion 13 is free, the desk-top 1 is pulled horizontally in the same direction from back to front of the desk, causing it to rise progressively upwardly and then downwardly relative to the carcass 2 as the frame 15 pivots on the carcass 2, in the manner illustrated in broken line in Figure 3. Continuation of the movement brings the top 1 extended on the frame 15 from the front of the desk, to project substantially horizontally level with the frame 15, as illustrated in full line in Figure 3.

In the normal configuration of the desk, the frame 15 lies upside-down on top of the slatting 5, but pivots up from there about the front of the desk as the top 1 is pulled forward. When, with the further pulling out of the top 1, the frame 15 pivots down into alignment with the slatting 5, the frame 15 can turn no further and locks in the horizontal attitude. The top 1 is then brought into alignment with the frame 15 to be locked projecting horizontally. In this condition, two legs 16 which are normally stowed folded up under the front edge of the top 1, are pivoted down to give front-end support to the top 1. The desk is now in the bed-configuration.

The futon 10 (not shown in Figures 3 and 4) can now be pulled by the portion 13 to withdraw the portions 11 and 12 from the recess 7 and deploy it lengthwise on the elongate, substantially-horizontal surface constituted by the aligned slatting 5 and 14 and desk-top 1. Once the futon 10 is clear of the recess 7, a hinged panel 17 of the back wall 8 is pivoted down over the recess 7 so as to allow the full available bed-length on the carcass 2 to be used for support of the futon 10.

When the desk is in the bed-configuration it can be readily returned to the desk-configuration by folding up the legs 16, re-stowing the futon-portions 11 and 12

within the recess 7, and pushing the top 1 upwardly after it has been unlocked from alignment with the frame 15.

Once the top 1 has been folded back over the carcass 2, the futon-part 13 can be inserted into the recess 6 and the top 1 closed onto the carcass 2 and locked in place to restore the desk to its normal, compact configuration.

The second form of desk will now be described with reference to Figures 5 to 7.

Referring to Figures 5 to 7, the desk has a panel-top 21 which is pivoted at the front to a base-panel 22 that is slightly bowed in its thickness from front to back and is supported by twin pedestals 23. The top 21 has a frame-surround 24 with an upper work-surface 25 that is backed by a sheet 26 of medium-density plastics-foam. A sheet 27 of the same foam provides the upper surface of the base-panel 22. A flat support surface for the sheet 27 is provided within a frame-surround 28 of the base-panel 22 by slabs 29 of high-density plastics-foam that bear tightly against one another over two strengthening cross-rails 30 of the frame-surround 28.

The desk is prepared for conversion from its normal desk-configuration shown in Figure 5, to its configuration as a bed, by first swinging two legs 31 up from their folded condition along the back of the frame-surround 28 (as illustrated in broken line for one of them, in Figure 5), and reducing its height. In the latter respect, the pedestals 23 are of telescopic structure and each incorporate a rise-and-fall mechanism 32 that when freed allows the height of the base-panel 22 to be adjusted up or down at will simply by exerting a gentle force, upward or downward, on it. Each mechanism 32 includes a constant-torque spiral spring for counter-balancing purposes and a latch for locking the base-panel 22 at the height to which it is adjusted. The latches of the two

mechanisms 32 are coupled, for example by cable, to a control (not shown) at the back of the desk, by which they can be withdrawn to free the pedestals 23 to telescope and then re-engaged to lock them at the
5 adjusted height.

The top 21 is now unlatched from the back of the base-panel 22 and lifted up and over pivotally to bring the legs 31 deployed from the upside-down top 21, down to
10 ground. With the height of the base-panel 22 reduced using the mechanism 32, the top 21 extends horizontally from it so that the sheets 26 and 27 are level with one another to provide a suitable flat, bed support-surface.

15 Two hinged headrests 33 for the bed are normally folded over to lie beneath the top 21 in the desk-configuration, but once the bed has been opened out as illustrated in Figure 7, they can be folded up to increase the effective length of the bed.

20 The desk can be readily returned to its normal configuration as a desk, by folding over the headrests 33 and then turning the top 21 back over the base-panel 22 and latching it closed. The mechanisms 32 are operated
25 to release the telescopic pedestals 23 for return and locking of the desk-top 21 at an appropriate height, and then the legs 31 are folded down to complete the return.

Claims:

1. A desk comprising a base-structure and a desk-top supported by the base-structure, wherein the desk-top is moveable relative to the base-structure for conversion of the desk to a bed, the desk-top when so moved extending substantially horizontally from the base-structure for defining with the base-structure an elongate substantially-horizontal support-surface of the bed.

2. A desk according to Claim 1 wherein the desk-top is pivotally mounted on the base-structure.

3. A desk according to Claim 2 wherein the desk-top is pivoted to a frame-member that is itself pivoted to the base-structure, and wherein the frame-member extends substantially horizontally from the base-structure intermediate the base-structure and the desk-top as part of said support-surface when the desk is converted to a bed as aforesaid.

4. A desk according to any one of Claims 1 to 3 includes a recess for accommodating and retaining a mattress or futon within the desk, the recess extending within the desk from a first part covered by the desk-top into a second part located behind an upright wall of the base-structure.

5. A desk wherein the base-structure for supporting the top of the desk includes interconnected recesses for accommodating and retaining a mattress or futon within the desk, the recesses extending within the desk from a first recess covered by the desk-top into a second recess located behind an upright wall of the base-structure, and wherein the desk-top is moveable relative to the base-structure for conversion of the desk to a bed, the desk-

top when so moved extending substantially horizontally from the base-structure for defining with the base-structure an elongate substantially-horizontal support-surface of the bed and uncovering the first recess to enable release of the mattress or futon from within the second recess for deployment on the support-surface.

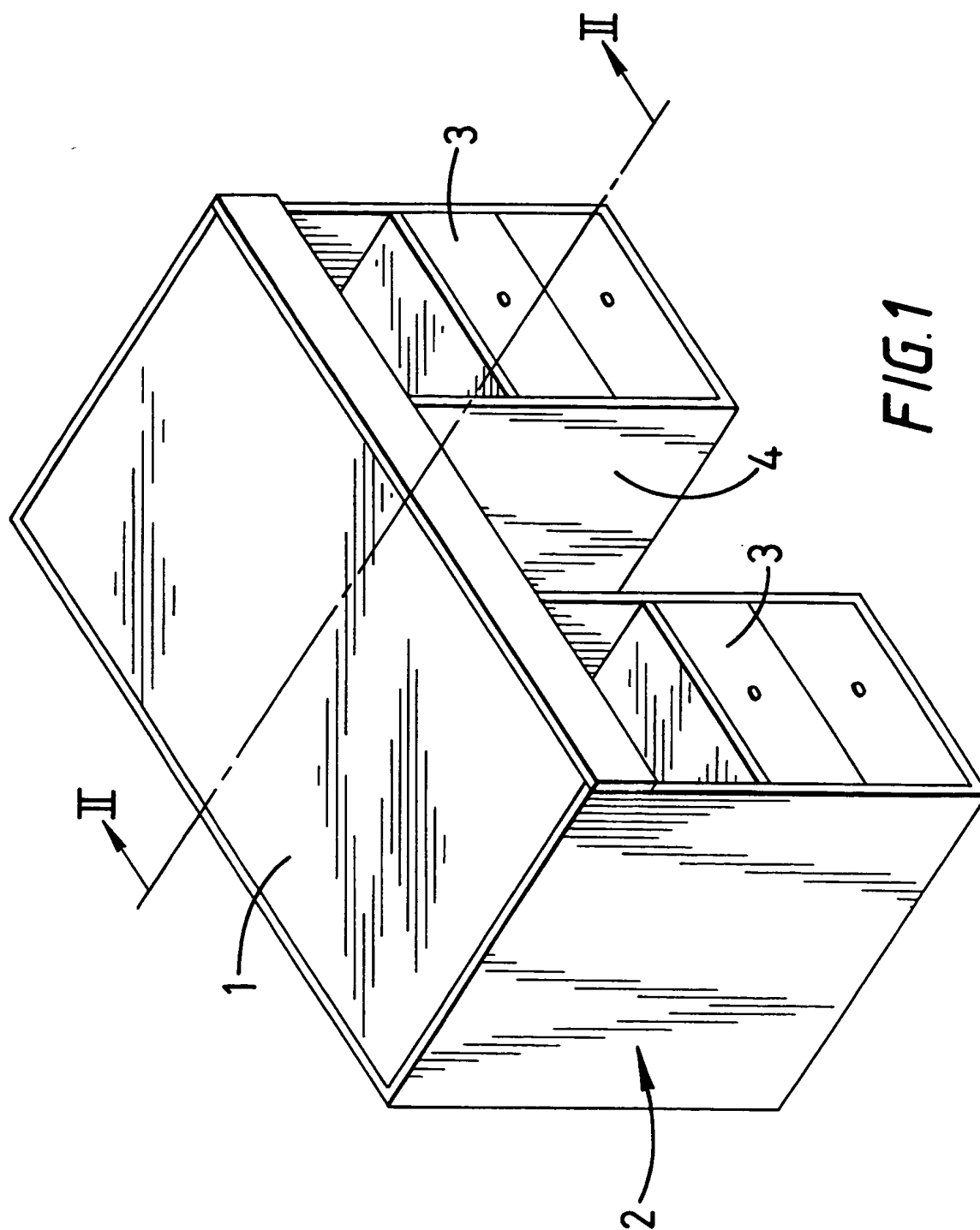
6. A desk according to Claim 1 or Claim 2 wherein the desk-top is pivoted to the base-structure for lifting up and over to extend upside down substantially horizontally from the base-structure.

7. A desk according to any one of Claims 1, 2 and 6 wherein an upper work-surface of the desk-top is backed by a sheet of plastics foam such that said sheet is uppermost when the desk is converted to a bed as aforesaid.

8. A desk according to any one of Claims 1, 2, 6 and 7 wherein the base-structure is a pedestal-supported panel having an upper surface of plastics foam.

9. A desk according to any one of Claims 1, 2 and 6 to 8 including means for selective adjustment of the height of the base-structure.

10. A desk according to any one of Claims 1 to 9 wherein folding legs are carried by the desk-top for selective deployment to support the desk-top in extending substantially horizontally from the base-structure.



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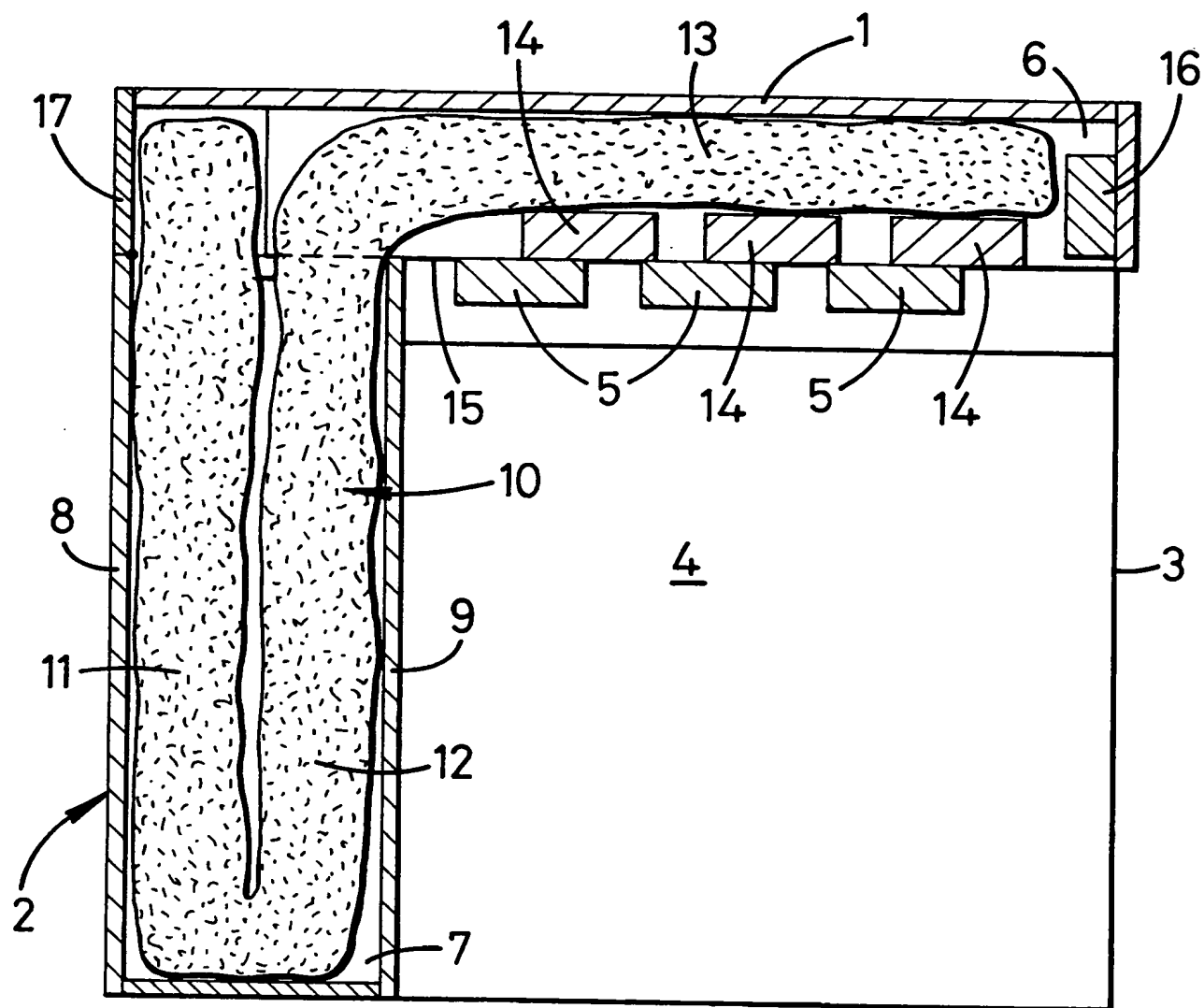


FIG. 2

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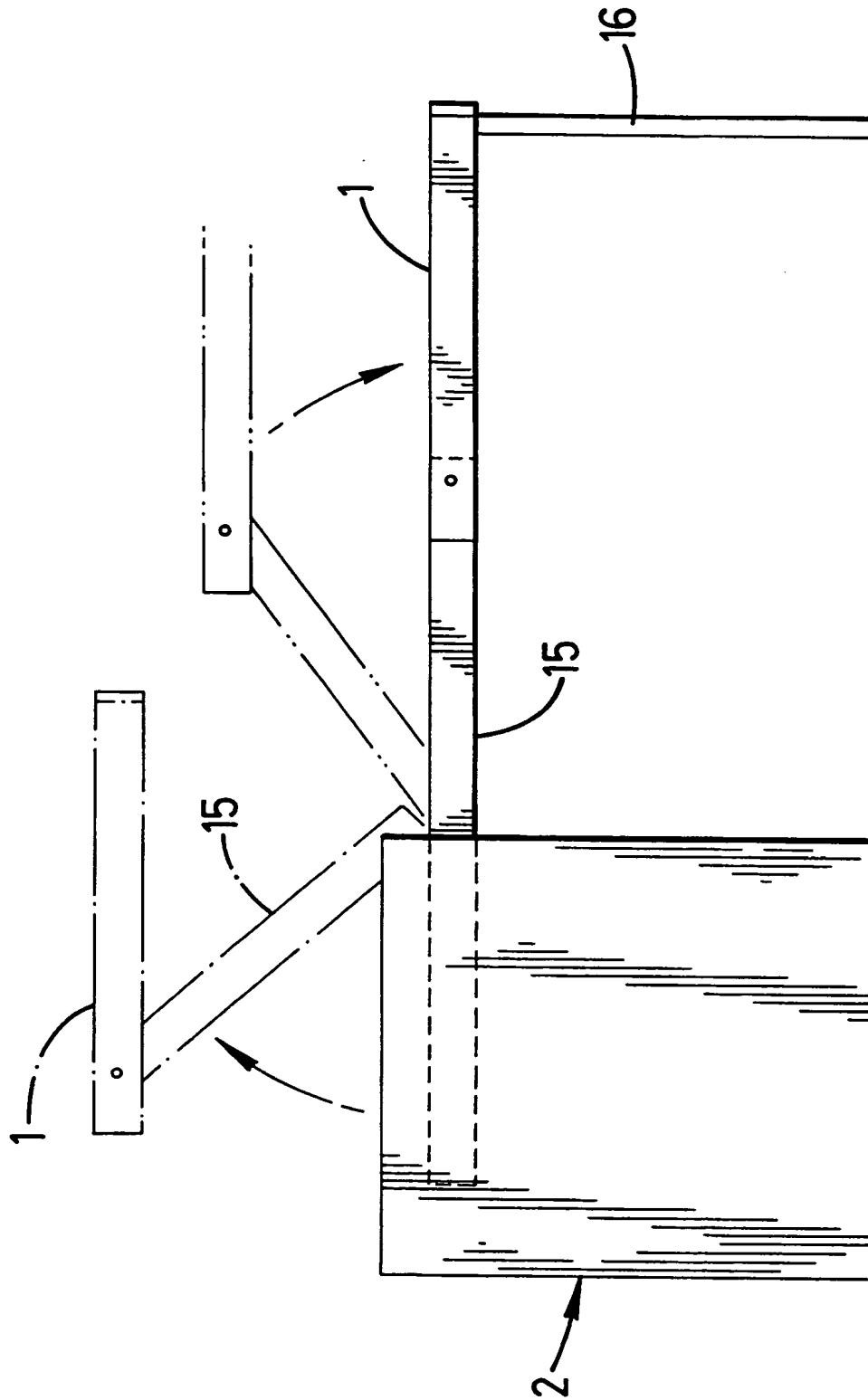


FIG. 3

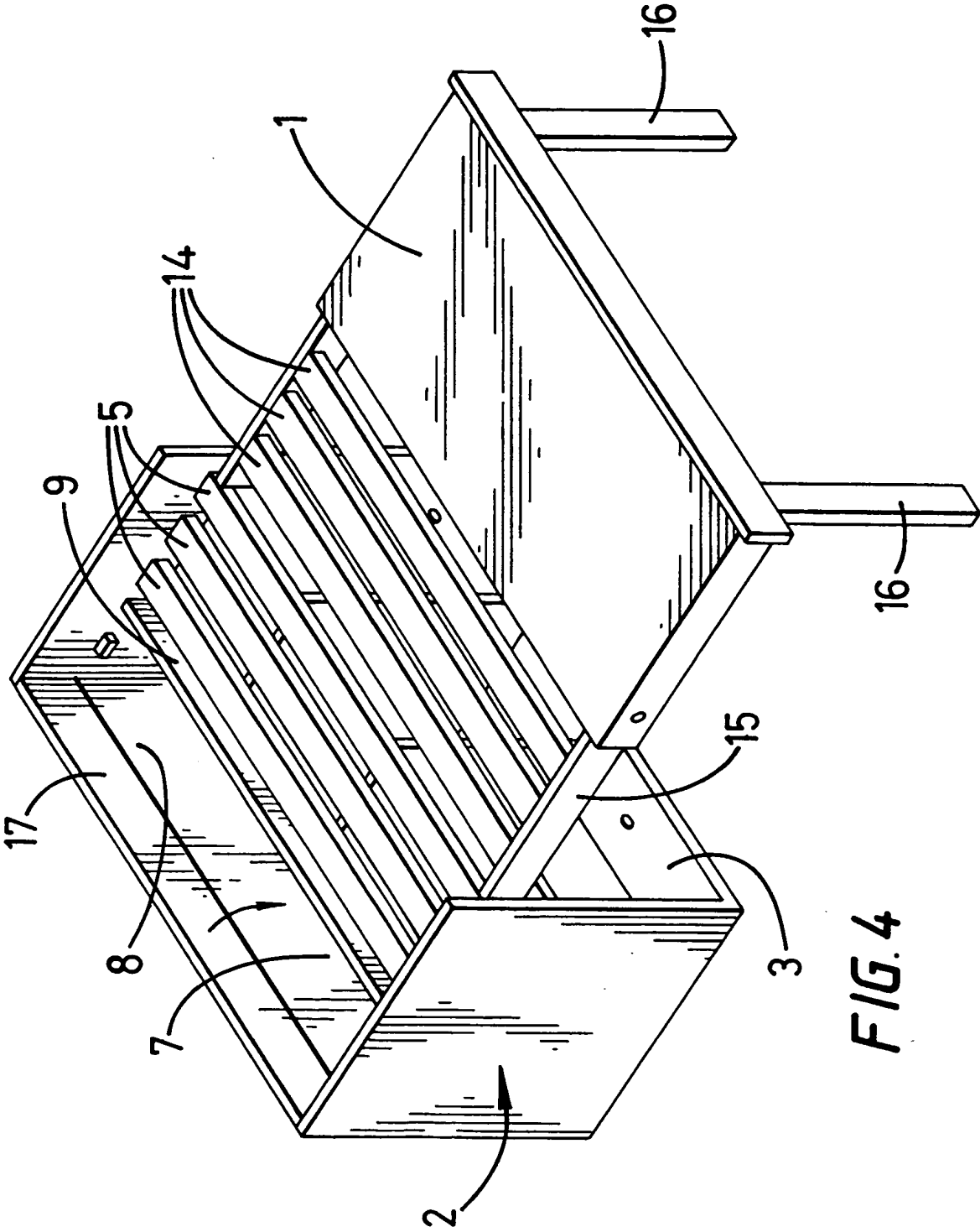


FIG. 4

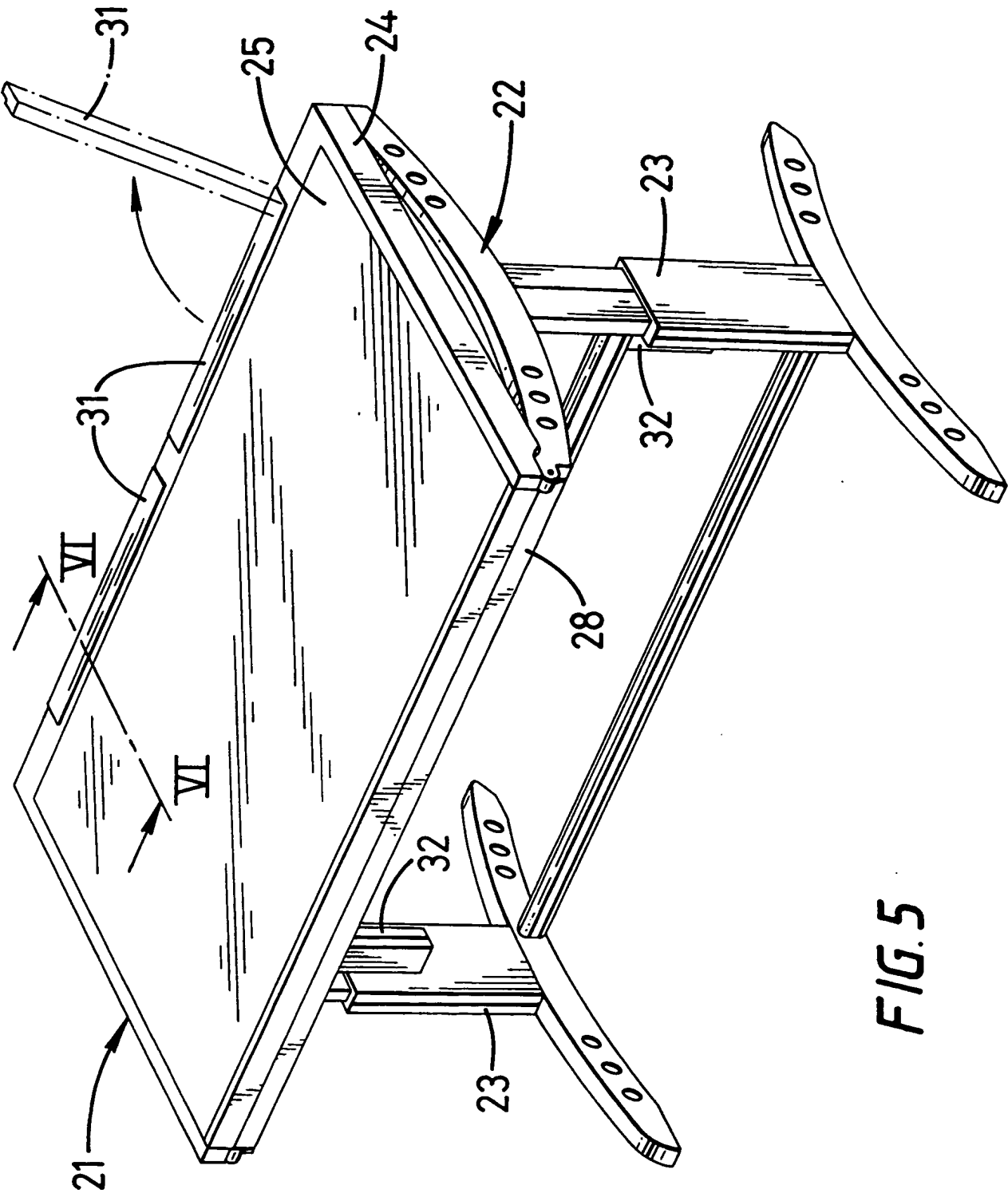


FIG. 5

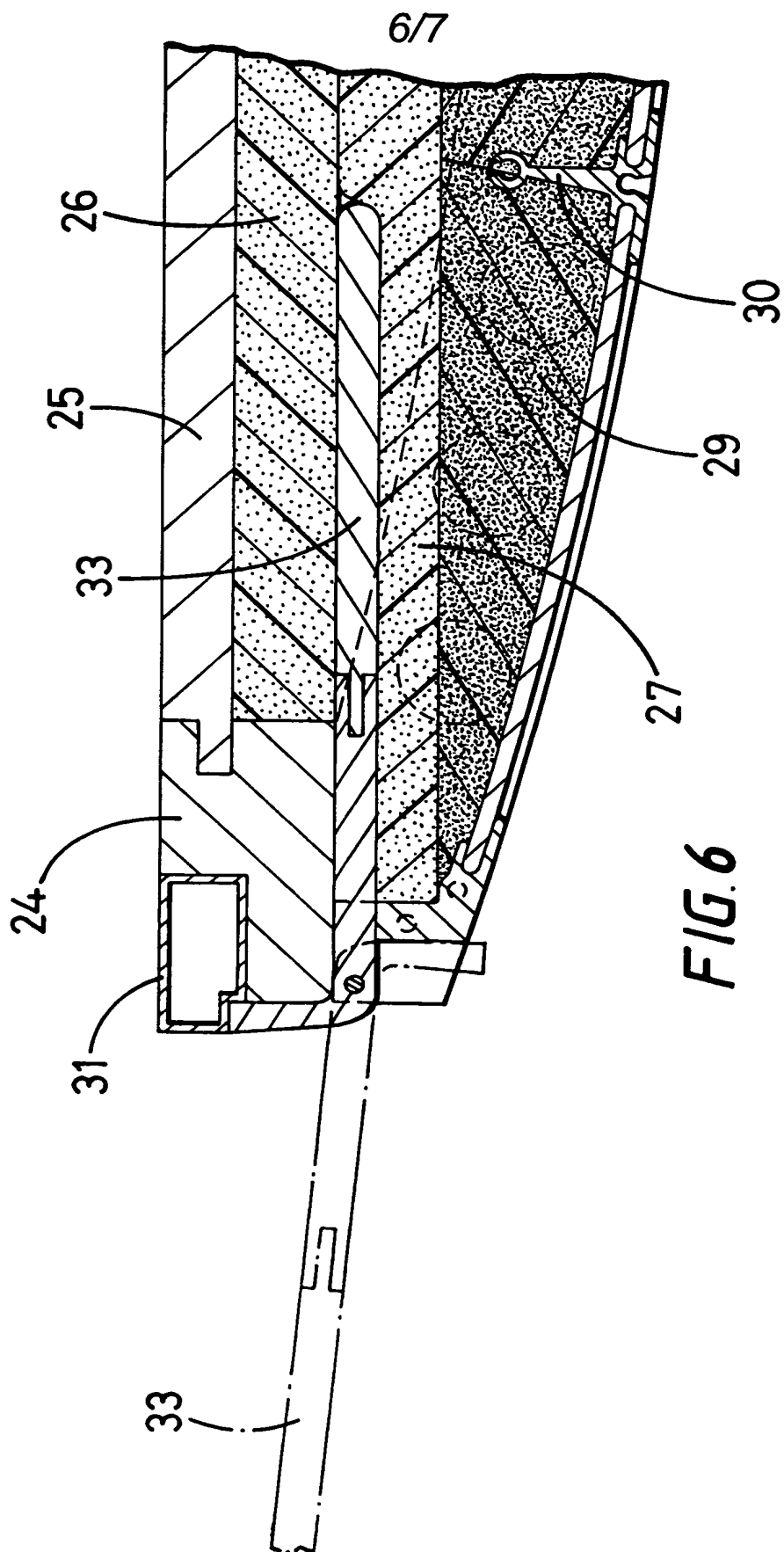


FIG. 6

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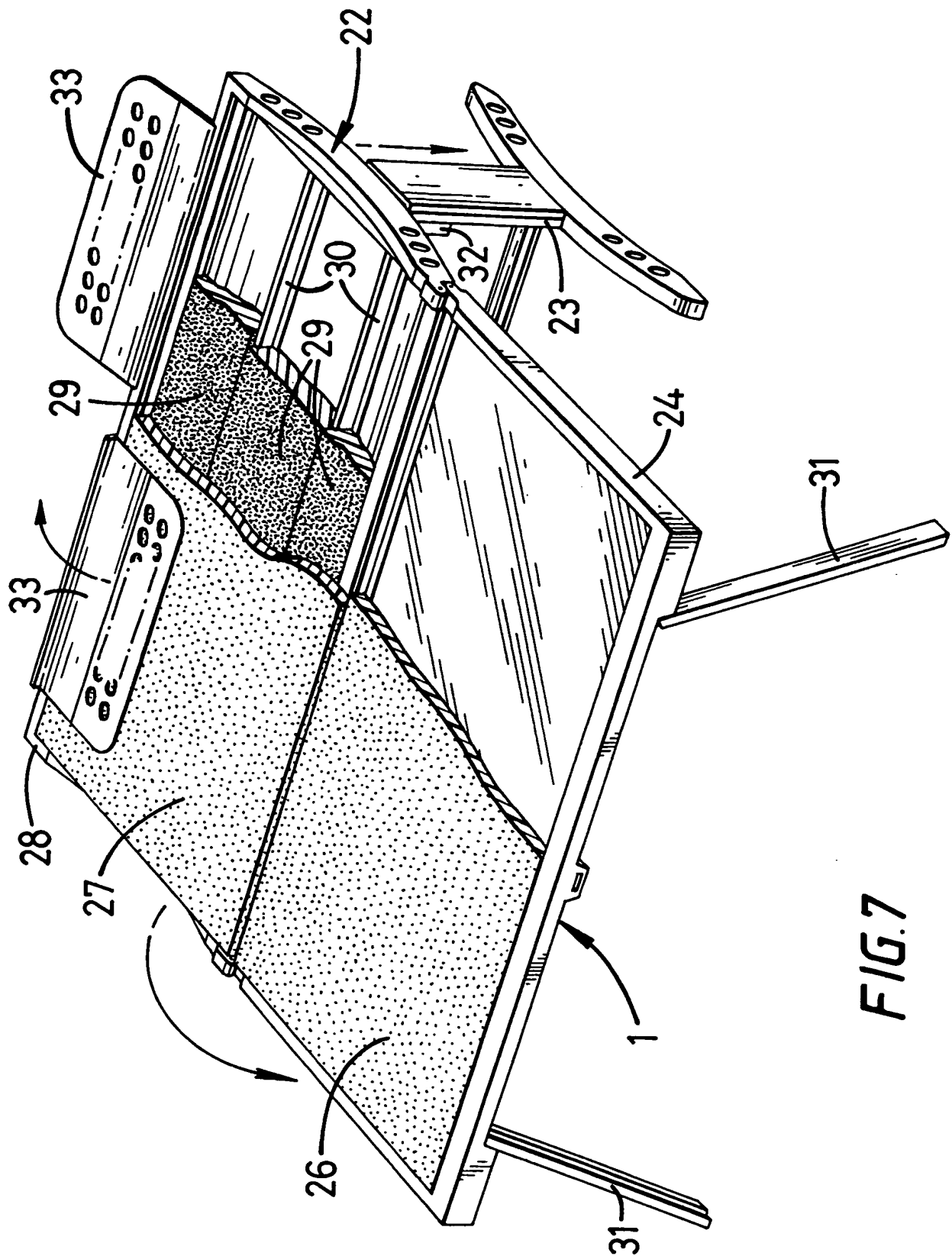


FIG. 7

Inter: International Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A47C17/62 A47B85/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A47C A47B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 467 816 A (MAISON M.) 22 June 1914 (1914-06-22)	1,2,6
A	the whole document ----	3-5,7-10
X	US 1 339 669 A (ANDREW RAPP) 11 May 1920 (1920-05-11)	1,2,6
A	the whole document ----	3-5,7-10
A	US 1 375 524 A (MCGHEE J.M.) 19 April 1921 (1921-04-19) page 1, line 24 - line 33 page 1, line 69 -page 2, line 111 page 3, line 23 - line 50 figures 1-3 ----- -/--	1-10

☒ Further documents are listed in the continuation of box C.

X Patent family members are listed in annex.

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INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	the whole document ----	3-5,7-10
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INTERNATIONAL SEARCH REPORT

Information on patent family members

Inter national Application No

PCT/GB 00/03123

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